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All the year round : a nature reader.

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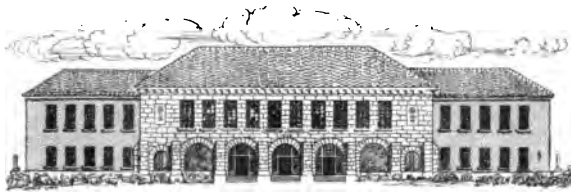
PART II.

WINTER

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ALL THE YEAR ROUND

A NATURE READER

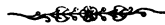
PART II: WINTER

BY

FRANCES L. STRONG
ST. PAUL TEACHERS' TRAINING SCHOOL

ILLUSTRATED BY

GERTRUDE A. STOKER
SUPERVISOR OF DRAWING, ST. PAUL



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NOTE TO THE TEACHER.

IT is not the purpose of the author of this series to offer, or even suggest, any rules for its use. If anything is established in education, it is the fact that aside from certain underlying principles and general directions, each teacher must be a rule unto herself. The methods which the author and her colleagues have found successful might be entirely out of harmony with an equally good system in some other city. It is to be presumed, however, that if this series of nature-stories should be so fortunate as to be received with favor by the educational public, it will occasionally find its way into the hands of some teachers who are not familiar with nature-work as developed in large cities and well-organized school systems. To these it may be interesting and helpful to know just "how it has been done" in the schools out of which these stories grew, and in which they have been used. Indeed, by way of comparison and suggestion, it may also be of assistance to those who have passed through the experimental stage and have wrought out a system of their own.

It has been the custom in the St. Paul public schools to pursue the following plan:

Materials. — The teacher goes out with her pupils to collect the materials referred to in the lessons, gathering enough to allow each pupil one specimen. Animals and plants are kept alive in the schoolroom to enable all to study their growth and habits.

After the material is at hand, the development of a specific lesson is divided (though not formally and rigidly) into five parts.

I. *Morning Talk.* — The work of the day is begun with a morning talk based either upon one of the natural objects, or upon a geographical topic, according to the season.

If an animal, a plant, or a stone be the subject of the lesson, pains are taken to see that each child is provided with a specimen. By skillful questioning, statements are drawn from the children concerning the facts the teacher wishes observed. New words are occasionally suggested and written upon the blackboard, and their frequent use is required throughout the lesson. In studying objects, it has, of course, been found advisable to consider them as belonging to some great family, making comparisons, and finding resemblances and differences. Children readily find this family element in all things studied.

If a geographical topic is chosen, observations are made from representations by means of pictures, sand-maps, cabinet specimens, etc. For instance, in studying the life of the American Indian, page 81, preparatory to the Hiawatha lessons, a sand-table showing a forest of pines, a mirror lake, a birch-bark canoe, a tent of cloth or paper, and a doll dressed as an Indian, furnishes the basis of an excellent lesson upon the life and habits of the Red Man.

II. *Drawing.* — The observation lesson is followed by a drawing lesson upon the subject studied. The child has already been supplied with the plant or animal. Each child draws his specimen carefully. It is by no means necessary for the teacher herself to be able to draw in order to get results. Each child is simply required to reproduce with his pencil just what he sees, just as he sees it. Children illustrate their language papers on flowers with water-colors or pencil. Work in free-hand cutting can be given from all objects, such as bottles, leaves, animals, etc. Scissors are used for this cutting. Modeling in clay is done from any object that will correlate with the other work. It has been found that in connection with the myths there is a great opportunity to develop imagination by allowing the child to illustrate the stories.

III. *Spelling.* — A spelling lesson upon the new and difficult words will follow.

IV. *Reading.* — The child is now ready for the reading lesson appropriate to the subject.

V. *Language.* — Finally, the children write descriptions of the object or country studied, giving free expression to the facts each has acquired.

It may be added that great interest may be excited by introducing into the number-work problems concerning the subject of the morning talk.

The literature, also, holds a very prominent place in this nature-work. The following list suggests poems to be committed to memory, and stories to be read in connection with this reader :

EVAPORATION.

- The Rainbow *Longfellow*
 Shelley's Clouds.
 A Drop of Water *Hans Andersen*
 Swan Maidens *Cooke's Myths*
 Published by A. FLANAGAN, Chicago. Price, 20 Cents.
 Snow Bound *Whittier*
 Snow Image *Hawthorne*
 Snow-Flakes *Longfellow*
 The First Snow-Fall *Lowell*

MAN.

- St. Nicholas, 1885, Cast Away in the Cold *Hayes*
 Primary Education, Jan. 1895.
 School Journal, Dec. 1894.
 Seven Little Sisters *Jane Andrews*
 The Children of the Cold *Frederick Schwatka*

As will be inferred from the method outlined above, the purpose of this book will be entirely misconceived, if it is looked upon merely as a convenient means of furnishing new reading-matter for the children (although it is sincerely hoped that it will do this). It is intended also to stimulate the thought, enlarge the vocabulary, and open the eyes of the children to the wonders of the world around them.

In the St. Paul public schools the manuscript of this series has been used in the second grade. It is thought, however, that it may be used in the third, and even the fourth, with equally good results.

ST. PAUL,
 October 17, 1895.

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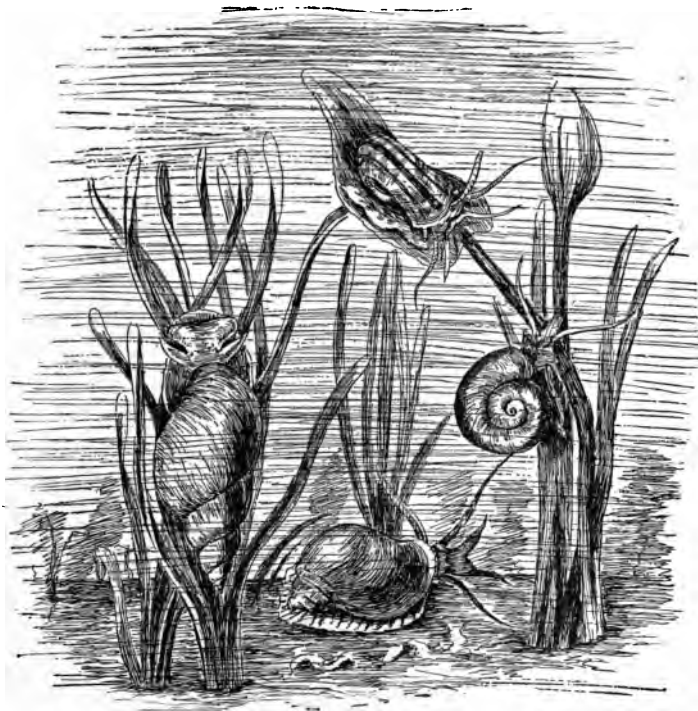
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WINTER.



SNAILS.

WINTER:

1. THE POND SNAIL.

THE pond snail makes its home in ponds. It has one broad foot which helps it to move about, or to fasten itself to different things it finds in the water.

The snail has two little horns or feelers in front. If we watch these feelers, we shall see that it keeps them moving as if it were feeling its way. The eyes are at the base of the feelers, and look like two black dots. The mouth is between them; but we shall find that it is below the feelers.

Have you ever seen this strange creature come to the surface to breathe? It has a little opening in its side, through which air passes. It is fine



sport to watch the snail come up to breathe. Then you can see the bubbles of air.

It has a shell house which it carries with it. Snails have been called very slow; but if we had to carry our houses on our backs, do you think we could move quickly?

The pointed end of the shell is called the apex. The opening where the snail comes out is the aperture.

Look closely and see all the little lines on the shell. These are the lines of growth. When the snail was a baby, its house was very small. As it grew, it needed a larger one. This it built little by little. In the water it drank it found something which helped to make the hard shell.

What do you think it was? Did I hear some one say lime?

Yes, it is lime which helps the snail in building its house. You will find some lime in the bottom of your teakettle. Take a piece and feel how hard it is.

2. THE CORAL.

I AM a tiny baby coral. When I was first hatched from an egg, I was very soft and shaped like a pear. I was covered with a fringe which quivered and kept me in motion.



For some time I swam around in the water, hunting for a good place to fasten myself. As I do not like muddy or sandy water, I have come down to the bottom of the sea where the water is quiet and clear. Here I have fastened myself to a rock and begun to grow. Gradually, at the top of my body there comes a hole which is my mouth, and around it, like a fringe, appear my feelers.

A sac, which is my stomach, forms in the center. When I take a drink of sea-water, I draw it into my stomach through my long hollow feelers. The lime from the water gathers at the bottom of the sea, where I am fastened to the rock. The lime in the water hardens the outside of me.

Now nothing soft remains, but my mouth and feelers at the top, and my stomach within.

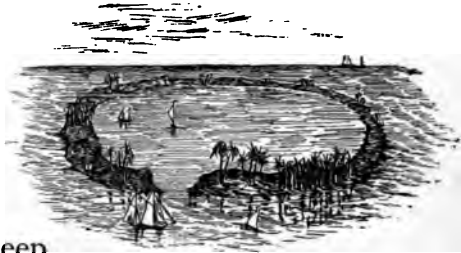
I have something strange to tell you. I begin to bud. In this way I spread and grow taller. Little corals grow out from my sides and base.

This way of growing is called budding, because it is a little like the branching of a plant; but each bud is a new coral, fastened to the one from which it buds, as the branches of a tree to the stem. As the corals grow and bud, the lower ones become solid.



3. THE CORAL REEFS.

I CAME from an egg. So it is not only by dividing or budding that I increase, but also by the hatching of eggs. I keep on budding and sending forth eggs.



There are many hills in the ocean, and I chose one of these for my home. The eggs settle down beside me. They begin to grow and bud and send forth more eggs. So, all around the foot of the hill, on which we have settled, we form a ring.

As each tiny coral forms new corals, it gradually hardens. Thus, the tiny creatures make a solid foundation for those that grow above and at the side of them.

Little by little, all the cracks between our walls are filled with sand and bits of shell.

The rocky walls, far down in the sea, form strange and beautiful shapes.

At last, the tiny corals reach the surface of the water and can grow no higher. Their work is done.

Then the great waves rush and beat against the coral, breaking off large pieces.

These pieces become worn into sand by the rolling and grinding done by the waves. The broken masses and sand are thrown up on top of the wall of coral.

Pieces of floating wood and sea-weed land upon the wall and there decay. They are mixed with the coral sand and a little soil is made.

Seeds are carried there by the birds, wind, and waves, and in time grow into plants, grass, and trees.

At last men come to settle and build cities upon these islands made by the tiny corals.

Many ships have been wrecked on these coral reefs. Before the reefs have reached the surface of the water, sailors cannot see them.

The ship strikes one of these walls and a large hole is made in the boat. Many lighthouses have been built to warn the sailors.

Ask your teacher to show you on the map the coral reefs near Florida.



CAST UP BY THE SEA.

4. WHAT BECOMES OF THE SHELLS.

I AM a shell. My home is in the great ocean. Our family is a very large one; much larger than your father's family, for I have thousands of brothers and sisters.

Some of my relatives are so very small that you could not see them without a microscope: others are very large.

Many of the little animals living in us are killed.

What do you think happens to the shell houses?

The great waves wash part of us up on the beach, but others sink to the bottom of the ocean.

The great rivers that flow into the ocean, bring mud and sand with them. This mud settles to the bottom with the shells.

Have you ever seen my home, the great ocean?

Try to think how many of the lakes you have seen it would take to make this great body of water, and how heavy it must be.

This water presses on us, until we are packed so closely that we become stone. Do you remember what we drank to make our shells hard?

Think what quantities of lime there must be in this stone. Would you like to know our name? We are called Limestone.

5. THE FOSSILS.

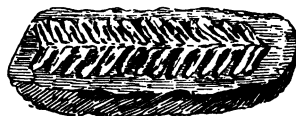
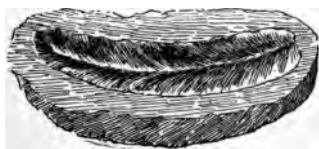
I AM the fossil of a shell. When the little animal inside my shell was alive, many thousands of years ago, I lived in the ocean. Now I am locked up in this storehouse of limestone with many of my neighbors who once lived with me in the sea.

Some of them lived in shells ; others were coral ; and others lived in stone lilies.

The tiny coral creatures built their beautiful towers in the sea. Living among them were little animals, that built up stone lilies about themselves. These lilies were fastened to the bottom of the sea by long waving stems.

I, too, lived among the coral. I had two shells fastened together like a clam shell.

The shells were beautifully chiseled and were of delicate tints of red, green, yellow, blue, and pink.



There were a great many other little creatures living in shells. Some were large; others very tiny. Some floated about in the water; others fastened themselves to rocks or to other creatures.

But we all gathered lime from the water, and made our hard frames. Then, as the tiny creatures died, we sank down, down to the bottom of the sea.

The earth in the water settled between us. The heavy water pressed so hard that it pressed us to stone.

Then, little by little, the great sea became lower and at last disappeared, leaving us on the land.

Do you think there are fossils forming now in the ocean? Yes, and on the land too.

I will tell you one way in which beautiful ones are formed. Streams of water flowing over limestone dissolve some of it.

On the banks of a stream a leaf or a twig falls, or some moss is fastened to a rock.

As the water slowly trickles over them, some of the lime settles and gathers around them. In time, they decay; but their shape is left in the stone.

Sometimes, fossils of leaves and fishes are formed in the lakes and rivers, just as they are in the ocean.

6. TESTING TO FIND LIME.

MISS ALLEN asked the children to bring to school everything in which they thought they might find lime. She told them she would show them how to prove whether they were right or wrong.

I wish you could have seen the many things that were placed on her desk the next morning.

Some brought many different kinds of shells; others the hard pieces found in the bottom of the teakettle.

Fred was anxious to try his pieces of coral, petrified wood, and moss.

James brought some of his agates and a piece of granite.

When Leo came to school, he passed a lot where men were building two new houses. He stopped, thinking he might find something there.

The men were building the cellar of one of the houses of a grayish blue stone. He took a piece of this. In the street, the men were mixing mortar to hold these stones together. Watching them,

he found that they put in large white lumps of something which came packed in barrels. The man gave him a large piece to take to school.

In the other house they were plastering the walls, and laying marble hearths in the fireplaces. The men gave him a small piece of the marble, and some plaster on a shingle.

Anna brought a dead starfish and a sea-urchin's house.

Mary's father was a doctor. She had heard him say that a baby had very soft bones and that an old person's were hard. Mary remembered how the snail's house was hardened, and she wondered if the lime in the water we drink could make bones hard.

Now was Mary's chance to test a bone, so she brought all of them that she could find.

Grace laid on the desk, a piece of chalk, a quartz crystal, and a carnelian.

That morning Miss Allen said, "I am glad you have brought so many things for us to test. This bottle is filled with acid. There are so many acids, I will give you the name of the one we use to test our stones.

"It is called muriatic acid. That is a pretty big word for children, but it is well to be able to call things by their right names.

"We must be very careful in using this acid. It is very strong. It will eat holes in wood and in our clothes, and burn our fingers.

"Tom, you may take this board and place it on the desk. Now put on it all the things we wish to test."

After this was done, Miss Allen poured a drop of acid on each article. What a bubbling and spluttering there was! It made one think of soda water.

Miss Allen said, "If it bubbles, you may know there is lime there; if not, there is none."

The shells, pieces from the teakettle, the petrified wood and moss, the coral, the sea-urchin's house, and the starfish were tried first. All these bubbled. Some bubbled more than others, showing that they contained more lime.

The marble, plaster, blue stone, and white lump Leo found at the new house were tested next. There was lime in all these.

Then the bones, chalk, quartz, carnelian, agate, and granite had drops of the acid poured on them. The bones and chalk bubbled, but the quartz, carnelian, agate, and granite made no fuss at all. They held no lime.

After these were tested, Miss Allen said, "I will

keep this bottle of acid on the shelf, and if you find other things you would like to test, I shall be glad to help you."

She then asked, "Do you know why it is that the water in lakes, rivers, and springs is hard, while rain water is soft?"

7. QUARTZ.

MY name is Quartz. I have a story to tell you about my family.

A little girl found some pretty stones and took them to school. I was among those stones, and very glad to make the children a visit.

Suddenly I found myself on a desk with a piece of glass and a knife. How sharp that knife looked! It fairly made me tremble, it was so near.

However, I need not have been afraid. Soon a boy picked up the knife and went to work to cut me in two. Just think, that sharp glistening blade could not even scratch me!

Then the boy picked up the piece of glass and tried to scratch me with that; but he could not make the least mark on my glossy coat.

I wondered if I could make a scratch on the glass, and kept saying to myself, "Don't I wish I had a chance to make my mark on that shiny glass!"

I think the boy must have heard me, for he tried to scratch the glass with me, and I found

that I could make a beautiful cut in it. Then he tried me on the blade of the knife, and I left a scratch on that too.

There were a great many of my family visiting the school that day. Some were as clear as glass ; some were smoky ; some were milky.

Carnelians and agates, which are used in jewelry and to make marbles, belong to my family. Have you ever cracked open a carnelian and seen the pretty red and white bands inside ?

A little girl had a purple stone in her ring and her teacher told her it was an amethyst. This is another of my sisters.

Tom broke many pieces of different kinds, and found that we did not break evenly, and that the faces made by the breaking were not smooth.

8. HOW THE SAND BECAME SANDSTONE.

YOU all know that the Quartz family is very hard, and that some of us are beautifully colored. I have been thinking of a strange story a friend of mine once told me. Would you like to hear it? Yes? Well, then I will tell you what happened to some of our family, years and years ago.

Many pieces of the Quartz family lived on the shore of the ocean. All day the great waves rolled up on the shores, and tossed the pebbles up and down, back and forth, knocking them against one another.

Gradually stones were broken into small pieces. By and by they were so small that passers-by said, "How beautiful and fine the sand is here!"

The wind, too, liked to play with the sand; for it carried it hither and thither over the beach. Sometimes the sand traveled back and forth two or three times in a day.

One day it said, "I wonder what kind of a journey I shall make to-day."

That day it met two new families on the beach, the Lime family and the Iron family.

These three families liked each other so well that they decided to live together. Not long after this, when they were settled for the day, a rainstorm came and beat down steadily upon them.

The lime grew soft, gluing the sand into one large lump, like a stone. It took many years to make this stone. Don't you think sandstone is a good name for a stone made of sand?

The Iron family is of a great many colors,—red, yellow, brown, and even green. They gave some of their color to the sandstone, and that is the reason we have red, green, and yellow sandstones as well as white.

9. A STORY ABOUT GLASS.

ONCE upon a time, hundreds of years ago, a strange-looking ship was sailing slowly on the great sea. The ship was heavily laden with soda, and had been out a long time.

The sailors were tired of the tossing of the great sea, and longed for the quiet land.

Suddenly across the waves, a speck was seen. Surely, that must be land!

A moment later, the cry "It is land" was heard from every sailor.

Soon the eager men landed and hastened to collect sticks for a fire. All were anxious to cook a dinner on the land.

The fire was started and the kettle brought. But they could find nothing with which to prop it. No stones were to be found.

What were they to do? Give it up? No, a thousand times no!

"Bring some of the lumps of soda," called the captain. Soon the dinner was cooking nicely; but stop, what was the trouble?

The fire had melted the soda and sand together, and on that far away coast, the sailors had — what do you suppose? — Glass.

This was the first glass ever made.

•

10. THE TRAVELS OF THE KING'S WINDOW PANES.

ONE of the kings of England was very rich. In his many palaces, he had everything money could buy. But his greatest treasures were his glass windows, for in those days very few people had such wonderful things.

In the far North, people used thin sheets of ice for their windows. In some countries, people stretched skins until they were so thin that the light could come through. These skins they used for window panes.

Where this king lived, they used neither the ice nor the skins for window panes. The wind and rain could blow in through the open spaces left to light the house.

How many colds those people must have had !

You will understand why this king thought so much of his glass windows. He owned a great many houses, living sometimes in one, and sometimes in another. He had only one set of windows for all his houses.

What could he do? When he traveled from palace to palace, he had his windows packed, and taken with him.

11. THE STARFISH.

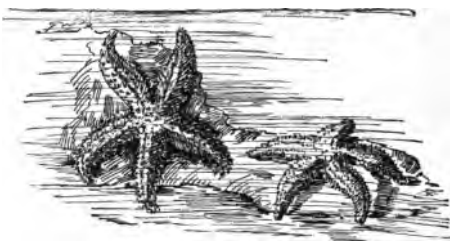
THE starfish is sometimes called a sea-star, five-finger, or five-fingered Jack. Its home is in the great ocean.

Starfishes are of different colors; some are orange, some crimson, some purple, and some brick red. There are others that are pale in tint, either delicate pink or faintly purplish. How pretty these little creatures must look in the water!

The starfish has five arms; under these arms are tubes which it uses as feet. It will fasten itself firmly to a rock, and will even allow its tube-like feet to be torn rather than let go.

There is a curious thing about the arms. If a hungry fish bites one off, or the big waves knock it against a stone and break one, the arm will grow again.

The starfish has an eye at the end of each arm. These eyes are



not at all like yours; they are very poor. But they answer nicely for the starfish.

The mouth is on the under side of the animal, in the center of the arms. The starfish is very greedy, and seems to do nothing but eat. It feeds on oysters, clams, and sea-snails.

It has a curious way of feeding. It catches its food in its five arms and holds it firmly. Then with its mouth it sucks its food from the oyster or clam.

The starfish lays eggs and carries them in its five arms. People who have studied this creature, have taken the eggs away from it, and let them float in the water to see what the starfish would do. It swims after them, gathers them up, and carries them off.

When a baby starfish is hatched, it has no arms, but is shaped like an egg. The little egg is covered with something hair-like until its arms begin to grow.

Have you ever noticed the many spikes on its back? These help to protect it from its enemies.



SEA LIFE.

12. THE SEA-URCHIN.

WHEN this strange animal is a baby, it is no larger than a pea. As the baby grows, it needs a larger house. It does not build a new one, but it makes the old one larger.

The sea-urchin's house is not made of one part or even two. It has five or six hundred pieces in its shell. These pieces are beautifully joined.

The shell is covered with green and purple spines. These spines make the sea-urchin look like a huge burr. They are very useful, for they protect it from its enemies.

It has many feet arranged in rows. The feet are little tubes with suckers at the ends. The sea-



urchin can push these feet out beyond the spines, and uses them to catch its prey. Sometimes, when the urchin moves about, it rolls like a ball.

The mouth of the sea-urchin is on the under side. It has five hard, pointed teeth. They do not move up and down, or from side to side. They move towards each other, meeting in a point.

One thing, which the sea-urchin does, will show you how hard its teeth are. It hollows out a house for itself in the hardest rocks, by digging it out with its teeth.

It is very funny to see a family of sea-urchins in holes in a rock, sometimes as many as a dozen together.

It also uses its teeth in eating. It is a very hungry animal, and eats all the little creatures that it can catch.

When the sea-urchin is dead, its spines sometimes fall off. Then we can see the beautiful shell. The spines are fastened to little knobs. You will see little rows of dots on the shell. These dots are the holes through which the sea-urchin pushed its feet. We can see five larger dots that were five eyes.

Many years ago, people thought that the shell

was the egg of some sea-animal, and called it a sea-egg.

The sea-urchin is not unlike the starfish. If we could close the starfish's five arms, it would have much the shape of the sea-urchin.



13. THE OYSTER.

WHEN we see the oyster and its shell house, it is hard to believe that it came from an egg.

The egg is very small. After being sent into the water, the wee baby in it begins to grow. It has a perfect little shell when it is hatched.

The baby oyster is a lively little fellow, and for two or three days after it is born, swims about like a young fish. Then it settles down for life by fastening itself to an old shell or rock on the sea-bottom.

Many of these little oyster babies do not live to be grown oysters. They are swallowed by other sea animals.

The oyster's shell is not pretty. You can see the layers as they have been built up, and its age is known by the lines of growth, and also by its size. The oyster is fit for food when it is four or five years old.

The shell has two covers joined by a hinge. Shells that have two parts are called bi-valves. The oyster can open and close its shell. It will close it at the least noise.

The shell is fastened to the sea-bottom by one of the valves, so this valve is larger than the other. There is a spot on the white lining of each valve. It is near the middle of the valve, and is a dark purple.

The oyster has a strong muscle which is fastened to the shell where you find the purple spots.

It breathes with gills. The mouth is at the smaller end near the hinge. The gills and mouth have little hairs all around them. These keep moving and breathing when the shell is open. They push the water into the mouth.

Sometimes oysters are found together in large numbers. They cover the bottom of the sea for miles and miles. These places are called oyster-beds.

A bird called the oyster-catcher, the starfish, and the crabs, are their enemies, and destroy great numbers of the oysters.



THE SPONGE DIVER.

14. THE SPONGE.

“WHAT is a sponge? Can you tell me, May?”

“No, Miss Hall,” said May. “I use my sponge every day, but I have never thought how it is made. Let me think! Do men make sponges as they do cloth and many other things?”

“No; people used to think a sponge was a plant, but that is not true. It is a little animal.”

“An animal! How very strange! Where is its home?”

“Its home is in the great ocean. The sponge comes from an egg. When it is hatched, the baby sponge sends out little hairs, which help it to move about in the water. As the baby has no eyes, it does not know where it is going, and often gets a hard bump.”

“Oh, Miss Hall, has the poor baby a head, ears, legs, tail, or arms?”

“No, May,” was the answer, “it has none of those; but it has a hole called a mouth. Soon it settles to the sea-bottom. With its mouth it

fastens itself to something, and never moves from that spot.

“The sponge has hard and soft parts. The hard part is called its skeleton, and it is this part of the sponge which we use. The soft parts were like jelly, and have been taken out. When the sponge was alive, all the holes were filled with the jelly.

“Sponges are not all of the same form. Some are cup-shaped, some pear-shaped, and some have many branches. There are some as large as a man’s head, and others no larger than an egg.

“Men fish for the sponges, and divers go into the water and tear them from the rocks.

“When they are taken out of the ocean, they are thrown into large tanks of water. Then all the soft parts are beaten out. The skeletons are washed and dried in the sun.”

“How many strange animals there are in the ocean,” said May, “and what a strange picture the sea-bottom would make!”

15. THE COAL FORESTS.

TRY to imagine yourself in a forest years and years ago. You will not meet any one, for this was long ago when the world was young, and before man came to live on this earth of ours.

It is a strange forest that we are about to enter. There is no winter there; the trees grow all the year round.

You know how your plants at home grow and bloom in the hot days of July. All the days are warm July days in this forest. The ferns are as large as our trees.

It is a dense forest, for every little seed falling into the warm mud below sprouts, and is soon a large tree.

Do you think that much sunlight could pierce through the many branches? You are right; it could not, and it is dark and gloomy among these great trees.

Hark! Is that the chirp of a robin? No! Here we have trees without birds, a forest with-



out a song, for there are, as yet, no birds upon the earth.

The only sound to break the stillness is the hoarse croaking of a strange frog and the chirp of a grasshopper.

Here we meet our old friends, the pines and the firs; and see the well-known cones waving among the branches.

We can find plenty of water plants and ferns, but not one flower or bright berry.

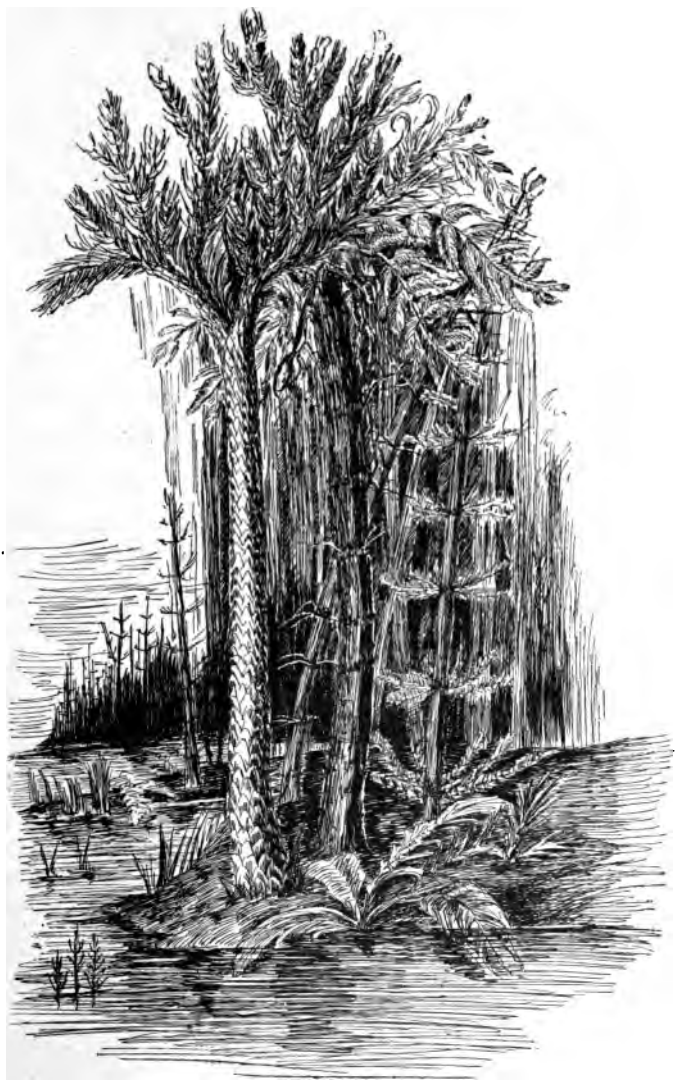
The trees spring up quickly in the soft, warm mud. The leaves come, fade, and fall just as quickly.

The trees, with their roots in mud, are easily blown down. They are then buried in the water, and partly decay. This matter becomes packed so closely that it turns into peat.

Hundreds and hundreds of years pass; tree after tree springs up, reaches its height, dies, and decays in the dark below.

Let us come away from the forest now, for a strange thing is about to happen.

Look! Do you see? A flood has covered the place where we stood such a short time ago. The beautiful great trees have fallen upon the



COAL FOREST.

soft bed of mud where their parents and grandparents have lain for hundreds of years.

Now, the mud and sand are settling upon them, forming shale and sandstone. These press heavily upon the beautiful old trees.

After many years, the water will disappear, and a new forest will spring up. It will grow, and then again the same thing will happen.

The weight becomes greater and greater as these layers are formed. The trees are packed more and more tightly, until they become one solid mass, called coal.

16. COAL MINING.

LAYERS of coal are not always straight and level. They are often slanting, or hollow like a basin.

Sometimes they bend, so that the coal comes to the surface of the ground. Then it is easy to mine the coal by digging into a kind of tunnel.

Sometimes very deep holes must be dug to reach the coal. These holes are called shafts. Cages or huge buckets are drawn up and down these shafts by means of ropes.

If you ever visit a coal mine, you will find yourself in a new world. Everything is black.

As you go down with a rush away from the sunlight and cool air, you wonder when the journey will end.

Suppose the ropes should break! You grasp the sides of the cage tightly, and go down into the darkness.

It is not a bit as if you were gliding down into the depths of the earth, but as though the earth were rising and you were standing still.

But at last the cage stops, and you are glad to step out. There are many passages dug down in the mine, all connecting with each other. So there is a kind of town below the ground with many streets.

You carry lanterns, and after a time get used to the darkness. You can see men moving about that look like shadows.

Sometimes the miner has to lie on his side to use his pick in loosening the coal.

When the coal has been loosened, other men load it in big baskets. These they push and pull into more open spaces, where the ponies can do the work.

Some of the ponies used in the mine never feel the warm sunshine or breathe the fresh air. They have stables in the mine; and hay, corn, and fresh water are sent down every day.





Ask your teacher to tell you the different ways in which fresh air is forced into the mine.

Not long ago children worked in the mines, but you will not find them there now. The law has put a stop to that.

What a noise there is! The coming down and going up of the cage, the shouting, the slamming of doors, the trotting ponies, and the cars of coal being taken to the shaft!

We follow our guide through the dark passages, and at last come again under the shaft



which leads to the world of light and life. We get into the cage, and up we go.

Even on a cloudy day it seems bright in the world above after the blackness in the mine.

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17. THE EVERGREENS.

ABOUT the time old Jack Frost comes to visit us, the trees begin to get ready for winter. Most of them lose all their leaves. They have work to do on the ground, to cover the plants and seeds.

Some trees are green all winter. We call these evergreens. Don't you think that is a good name for them?

The leaves are not like those of the oak or maple. They look like needles, and so they are called needles. The frost cannot hurt these green leaves.

Most of the evergreen trees are shaped like cones, each having one large central stem. The smaller stems or branches grow in whorls around the large one.

Often little scale-covered buds will be found at the ends of the branches.

About the base of the smaller branches a circle of scales will be found. This shows that these branches have grown from the buds.

The lighter color of the branches shows how much they have grown this year.

The branches of the evergreen are very tough, and the loads of snow do not break them.

The flower is not brightly colored. It is a cone made up of many scales,—all beautifully arranged.

At the base of each scale are two little cradles with a baby seed in each. Each baby seed has one wing which helps it to fly to its new home. Within each seed is a baby tree, with its store-house of food.

In the older cones the scales spread and separate.

Have you ever shaken one of the cones and seen the little winged seeds fly out?

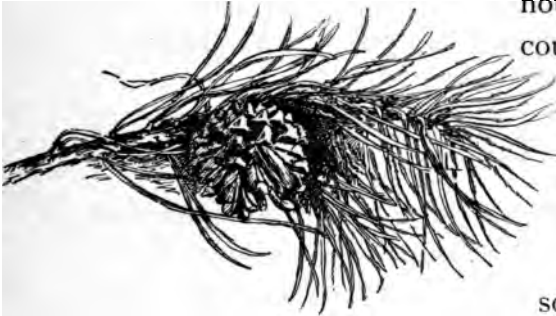
The evergreens make the winter world brighter and more beautiful.

The birds love the evergreens. Can you tell why?

18. THE PINES.

PINES and firs are given the first place among the woodland treasures. This is because of their great usefulness.

They are very useful to ship-builders and house-builders, who



could find nothing to fill the place of the lumber obtained from these trees.

The trunk of some fir or pine is used in every ship for a mast. When the trunks are sawed into strips, we have the red, yellow, and white boards used in finishing houses.

The Scotch Pine becomes a tall tree when growing in good soil, but in poor soil and in very high places, it is a kind of shrub.

The needles grow in sheaths about an eighth of an inch in length. In this sheath are two twisted needles. One side of these needle-like

leaves is grooved; the other is curved. The grooved sides face each other, so that when placed together they look like one needle.

The cones are small, being an inch and a half or two inches in length.

The White Pine is one of the largest of the forest trees, being often one hundred and thirty to one hundred and fifty feet in height. Some have been cut that were over two hundred feet.

From this tree comes most of the lumber used for the framework of buildings, timbers of bridges, and masts of ships.

The White Pine has five long slender needles in each sheath. They are longer and finer than the needles of the Scotch Pine.

Each needle has three sides. One side is flat; two are curved.

The Pitch Pine has dark, stiff needles, arranged in threes. They are not all of the same length. The cones are also of different lengths.

Large quantities of the Pitch Pine are used for fuel. Tar and lamp black are sometimes made from it.

19. THE DISCONTENTED PINE.

ONCE a little Pine-tree,
In the forest ways,
Sadly sighed and murmured,
Thro' the summer days.
"I am clad in needles —
Hateful things!" he cried,
"All the trees about me
Laugh in scornful pride.
Broad their leaves and fair to see;
Worthless needles cover me.

"Ah, could I have chosen,
Then, instead of these,
Shining leaves should crown me,
Shaming all the trees;
Broad as theirs and brighter,
Dazzling to behold,
All of gleaming silver —
Aye, of burnished gold.
Then the rest would weep and sigh:
None would be so fine as I."

Slept the little Pine-tree
When the night came down,
While the leaves he wished for
Budded on his crown.
All the forest wondered,
At the dawn, to see
What a golden fortune
Decked this little tree.
Then he sang and laughed aloud;
Glad was he and very proud.

Foolish little Pine-tree!
At the close of day,
Thro' the gloomy twilight,
Came a thief that way.
Soon the treasure vanished;
Sighed the Pine, "Alas!
Would that I had chosen
Leaves of crystal glass."
Long and bitterly he wept,
But with night again he slept.

Gladly in the dawning
Did he wake to find
That the gentle fairies
Had again been kind.

How his blazing crystals
Lit the morning air!
Never had the forest
Seen a sight so fair.
Then a driving storm did pass;
All his leaves were shattered glass.

Humbly said the Pine-tree,
"I have learned 't is best
Not to wish for fortunes
Fairer than the rest.
Glad were I, and thankful,
If I might be seen,
Like the trees about me,
Clad in tender green."
Once again he slumbered, sad;
Once again his wish he had.

Broad his leaves and fragrant,
Rich were they and fine,
Till a goat at noonday
Halted there to dine.
Then her kids came skipping
Round the fated tree;
All his leaves could scarcely
Make a meal for three,

Every tender bud was nipt,
Every branch and twig were stript.

Then the wretched Pine-tree
Cried in deep despair,
"Would I had my needles;
They were green and fair.
Never would I change them,"
Sighed the little tree;
Just as nature gave them
They were best for me."
Then he slept, and waked, and found
All his needles safe and sound!

Eudora S. Bumstead. — From *Fairy Land of Flowers*.

20. THE FIR TREE.

OUT in the forest stood a pretty little Fir Tree. It had a good place, with plenty of sunshine and air, and all around it grew many larger trees—pines as well as firs.

But this little tree wished to become taller. It did not care for the warm sun and fresh air. When the children came to look for berries, they would often sit down by the little Fir Tree and say, "How pretty and small that one is!" As the tree wished to be taller, it made it very unhappy to hear that.

The years passed, and it grew taller and taller. In trees, one can always tell by the number of rings they have, how many years they have been growing.

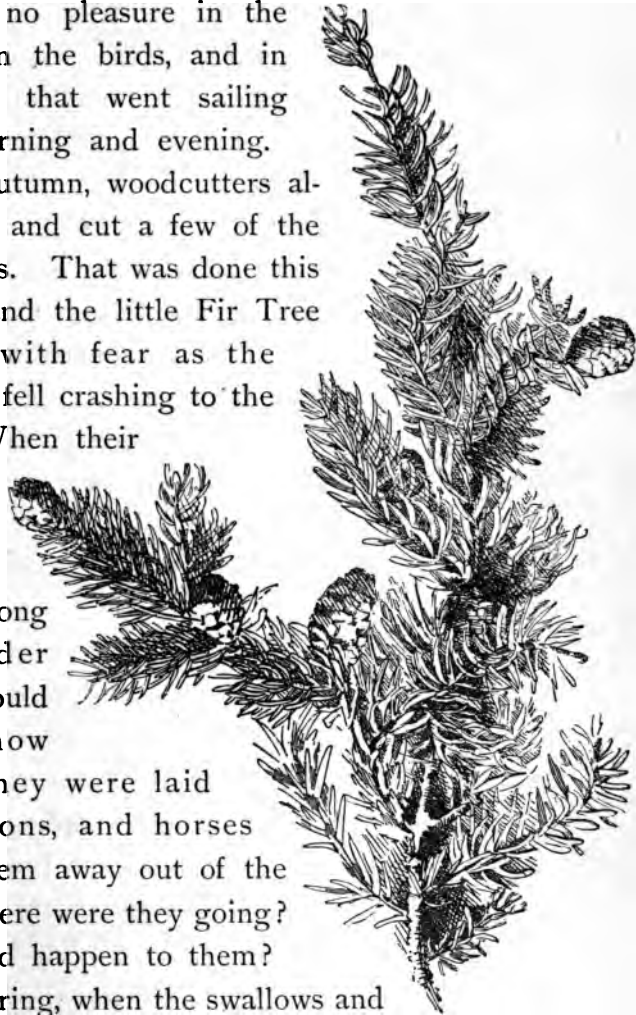
"Oh, if I were only as tall a tree as the others!" sighed the little Fir, "then I would spread my branches far around, and look out into the wide world.

"The birds would then build their nests in my boughs, and when the wind blew I could nod just as grandly as the rest."

It took no pleasure in the sunshine, in the birds, and in the clouds that went sailing over it morning and evening.

In the autumn, woodcutters always came and cut a few of the largest trees. That was done this year, too, and the little Fir Tree trembled with fear as the great trees fell crashing to the ground. When their branches were cut off, they looked so long and slender that you would hardly know them. They were laid upon wagons, and horses dragged them away out of the wood. Where were they going? What would happen to them?

In the spring, when the swallows and stork came, the Tree asked them, "Do you know where the trees are taken? Did you not meet them?"



The stork said, "Yes, I think so. When I flew back from my winter home, I met many new ships. These ships had stately masts. They smelt like fir, and I am sure those were the trees."

Then the Fir Tree said, "Oh, that I were only big enough to go over the sea!"

The wind kissed the Tree and the dew shed tears upon it, but it did not understand that.

When Christmas time came, very young trees were cut. These trees kept their branches. They were put on wagons, and horses dragged them away.

"Where are they all going?" asked the Fir Tree.

"We know that! We know that!" chirped the sparrows. "They are all dressed up with beautiful things. We have looked in through the windows and seen them planted in the middle of a warm room, with gilt apples, playthings, stars, and candles hung on their branches."

"Perhaps I may be dressed in this way some day," cried the Fir Tree. "That would be better than going across the sea."

"Rejoice in us," said Air and Sunshine. But the Fir Tree did not rejoice at all; it only grew



READY FOR THE CHILDREN.

and grew. Winter and summer it stood there, a dark green.

The people who saw it said, "That's a handsome tree!" Next Christmas it was cut before any of the others.

It was very sad at parting from its old home. It seemed to know it would never see its dear old friends again.

Soon the Tree felt itself unloaded in a yard with other trees, and heard a man say, "This one is beautiful; we want only this one."

Then two servants carried the Fir Tree into a beautiful house.

What the sparrows had told it came true. On some branches the people hung little bags of candy; golden apples and nuts hung down as if they grew there; dolls swung from it, and a hundred candles of all colors were fastened on all its branches. "This is splendid," thought the Tree.

How the Tree did enjoy it all! But some of the pretty things were taken from the Tree, and given to the happy children, who danced around the room.

The candles burned down to the twigs, and were put out. Then the happy people went to

bed, leaving the poor Fir Tree quiet and alone.

In the morning the servants came and carried the Tree upstairs to the garret, and put it in a dark corner.

“What is the meaning of this? What am I to do here?” thought the Tree.

Days and nights went by, and nobody came.

“It must be winter outside,” thought the Tree. “The people cannot plant me now, so they leave me here till spring comes. That is kind, but how dark it is here, and how bare! I wish I were back in the forest with the hares.”

But one morning people came into the garret. They were putting away boxes, and, seeing a tree, brought it out. The servant dragged it to the stairs, where the daylight shone.

“Now life is beginning again!” thought the Tree.

It felt the fresh air and the first sunbeams. It was close to the garden, and here everything was blooming.

In the yard two merry children were playing, and when they saw the Tree, one of them said, “Look at that old Fir Tree!”

The Tree looked at the blooming flowers, and then looked at itself. How it wished it had

stayed at home in the forest with the sunbeams, the air, the flowers, and the birds!

Soon the servant came and chopped the Tree into little pieces.

It made a bright blaze under the teakettle, and sighed and sighed. Each sigh sounded like a little shot, and at last the Tree was all burned!

Adapted from *Hans Andersen.*

21. THE LITTLE FIR TREES.

HEY! little evergreens
Sturdy and strong!
Summer and autumn time
Hasten along.
Harvest the sunbeams, then,
Bind them in sheaves,
Range them and change them
To tufts of green leaves.
Delve in the mellow mold,
Far, far below,
And so,
Little evergreens, grow!
Grow, grow!
Grow, little evergreens, grow!

Up, up so airily
To the blue sky,
Lift up your leafy tips
Stately and high;
Clasp tight your tiny cones,
Tawny and brown;



EVERGREEN TREES.

By-and-by, buffeting
Rains will pelt down.
By-and-by bitterly
Chill winds will blow,
And so,
Little evergreens, grow!
Grow, grow!
Grow, little evergreens, grow!

Gather all uttermost
Beauty, because —
Hark, till I tell it now —
How Santa Claus,
Out of the northern land,
Over the seas,
Soon shall come seeking you,
Evergreen trees!
Seek you with reindeer, soon,
Over the snow,
And so,
Little evergreens, grow!
Grow, grow!
Grow, little evergreens, grow!

What if the maple flare
Flaunting and red,

You shall bear waxen-white
Tapers instead.
What if now, elsewhere
Birds are beguiled,
You shall yet nestle
The little Christ-child!
Ah, the strange splendor
The fir trees shall know,
And so,
Little evergreens, grow!
Grow, grow!
Grow, little evergreens, grow!

Evaleen Stein in *St. Nicholas*. — By permission.

22. THE ESKIMO.

PART I.

I AM a little Eskimo baby, and my name is Boreas. I do not wear clothes until I can walk. When I am out of doors, I ride in a skin cradle on my mother's back. When I am in the house, I roll upon the floor on a warm fur rug, and play with my puppy.

When I am a man, I shall have two suits of clothes, made of fur. The inner suit will have the fur next to my body, and the outer suit will have the fur on the outside. My outer suit will have a hood. When I put the hood on, Jack



Frost can see nothing but my eyes, nose, and mouth.

I once heard a white man tell papa, Eskimos all dressed so much alike that he could not tell girls from boys, or women from men.

Do you know what kind of a house I live in? It is not made of wood like yours, for it is so cold in this country that no trees can grow here.

My house is made of snow, and it looks like the half of an egg-shell, only larger. We do not heat it with a stove, for that would melt the snow. We warm it with lamps. These lamps are made of stone, and look like clam-shells. We burn oil in them, and use moss for wicks.

It must always be cold enough in the house to freeze, or the water begins to drop from the top, and then we know the house is melting.



One day our house was too warm, and the snow began to melt. Some of it dropped down papa's neck, some fell into our soup and splattered it on mamma. One piece fell on me, and I jumped. I did not like it. Papa had to mend the melted places with fresh snow.

Our house has only one room and one door. The doorway is low and small, so that papa and mamma must creep through it on their hands and knees. The door is a big block of ice. It is used as much to keep out the dogs as the cold.

Our dogs will sleep on the hard ice and snow, if they have plenty to eat. Papa never feeds them oftener than every other day, and generally about every third day.

What do you think is the best food they can have? It is tough walrus hide, about an inch thick. One day the dogs were very hungry, and, as many as could, put their heads in at the doorway. They watched mamma to see if she would give them something to eat.

Papa has many dogs. He has one team of nineteen. Once the dogs worked seven days without eating. They grew very thin, but none of them died.

Do you think you could drive dogs? Papa

says he never saw a white man who was a good dog-driver. The forward dog of a team is called the "leader" or "chief." The Eskimo dog-driver



manages the leader by speaking to him, making him go to the right or the left as he desires. The other dogs watch the leader, and do as he does.

We could not live without our dogs. They are our horses and oxen for drawing loads, and our hunting dogs, too. The dogs like to hunt. When they are near the game, papa slips their harness off. Then they stand around the animal, and keep it until papa can kill it.

Sometimes, if they go too near a bear or a musk ox, they are killed.

One night, we heard a loud noise out doors on the ice. Papa jumped up and went out. He found a large bear breaking the ice to catch fish.

Mr. Bear did not know papa was near until he shot. Then the bear ran, and papa ran. Papa called the dogs, too; but the bear reached the

ice. He went up on an iceberg, which was so steep that no one could go after him. The next day papa saw him up there throwing big pieces of ice down on a seal.

23. THE ESKIMO.

TEXT II

SOME of our sleds are cut out of solid ice, with fish frozen in them to make them strong. Others are made of the bones of walruses and whales and have ice runners.

I am very happy to-day, for mamma gave me some candy this morning. Shall I tell you about our candy? When papa kills a water-fowl called a dovekie, mamma cuts off the red feet and takes out the bones.

She then stretches and dries the skin. When it is quite dry, she fills it with reindeer tallow, and that is one kind of candy. The only other kind is the marrow from the leg bones of the reindeer. Shall I send some to you? The reindeer comes to see us only in the summer. That is the only time it can find moss to eat. The reindeer is almost the color of the moss it eats. Papa kills as many as he thinks we shall

UNC,

Mamma cuts up the meat, dries it, and keeps it to use during the winter. She dries fish also. We eat seals, walruses, and whales.

Did you ever see a seal? They are not like fish, if they do live in the water. Fish can breathe in the water, but seals cannot. Fish have cold blood, but seals have warm blood. Fish cannot live out of the water, but seals can live in the water or out of it. Hunters kill the seals for food and clothing.

In summer we eat the eggs of ducks, geese, and other birds. The birds' nests are so thick in places, that you cannot walk without stepping on eggs. Did you ever see an eider-duck? There are many here in the summer.

It is not very warm here in the summer. One day, after it had been dark day and night for many weeks, I went with my mamma to the top of a high hill. We saw the sun for a few moments.

The next day he came again, and we saw him a little longer.

Every day he came back, staying longer and longer, until he moved higher in the sky, making one great circle, shining all day and all night for many weeks.

Then he went away again, and it was cold and dark as before; but we like the cold as well as a fish likes water, a bird the air, and flowers the sunshine. We use the little God gives us, and are happy.

L. BARTLETT.

24. THE SEAL.

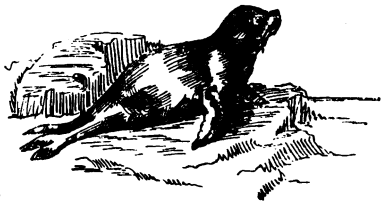
THE seal lives in the sea. It makes its home in the north, where large pieces of ice float in the ocean.

There are many kinds of seals. Some are no larger than dogs, and are called sea-dogs. Others are about thirty feet in length, and are called sea-elephants, because of their great size.

The head of the seal is shaped somewhat like that of a dog; it has whiskers like a cat, and large, beautiful eyes.

Its feet are much like fins, and help it to swim in the water. The skin between the toes makes good paddles of all the feet. It sometimes crawls up on the ice and stones, but it is clumsy out of the water. It makes short jerky leaps, dragging along the hind fins, or paddles.

In the water, the seal is very graceful, and can swim *very fast*. It uses its hind



paddles for swimming. The front ones are used to turn itself around.

The fur of the seal is well suited to the cold water. It is very thick, and is kept oiled by a fat the seal has in its skin. Next the skin is a layer of fat which helps to keep the seal warm.

Its food is chiefly fish, but it finds other food in the sea.

Seals are easily tamed, and may be taught to do many tricks. They know their master's voice, and will come at his call.

The Eskimos would starve and freeze if it were not for the seal. They use its flesh for meat, and from the fat get oil to burn in their lamps. Their warm clothes are made of the seal fur; their boats are covered with sealskin. The whips which they use in driving their dogs are also made of the skin. The seal's bones are made into hooks.

25. HUNTING SEALS.



THE Eskimos spend much time in hunting seals. Sometimes the men go out in their boats and try to throw their harpoons into the seals as they swim in the water or are lying on the large blocks of ice.

There is another way the Eskimos hunt seals. In the far north, the ice on the ocean is very thick; but the seal comes up under the ice and scratches a hole through it with its sharp claws. Then it makes a little dome through the snow which covers the ice.

Through this snow dome, the seal makes an opening just large enough to let in some air. These holes are so small that the Eskimos often pass without seeing them.

Here the seal comes to breathe. It breathes in short gasps, which can easily be heard. If the Eskimo hears a seal blowing, he seats himself on a block of ice to wait for it to come *again*.

The seal may come up at another hole to breathe, and then the hunter has lost him. But if he hears a blowing, he places his spear in the hole, and catches the seal.

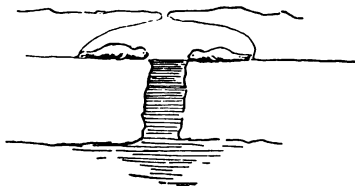
Sometimes, the mother seal hunts for a breathing hole under very deep snow. She makes a much larger dome, so that the ice will form two shelves two or three feet wide.

Mrs. Seal puts her babies on these shelves, and brings them food. If she hears a noise, she hurries away, leaving them on the ice-shelves.

She thinks they are quite safe, for they are the same color as the snow.

The Eskimo, however, has learned Mrs. Seal's place for her babies, and often carries the baby seals home.

If they are not found by the Eskimos, these babies spend their time on the shelves until they are old enough to swim away with their mother. When they can do that, they are able to care for themselves.



26. HASSAN.

HASSAN is a little Arab boy. He lives in the desert where it is very hot and sandy. The Arabs do not build houses, but live in tents. There are no beds or chairs; they have many soft cushions instead.

The sun is so hot on the desert, that the Arabs stay in their tents and sleep in the daytime. In the evening, when it is cooler, Hassan's father sits in front of the tent and smokes his long pipe, while the children play in the sand.

When they have their supper, Hassan's father eats first; then his mother and the children have theirs; and the servants eat what is left. That would seem strange to us in this country.

The Arab's tent is pitched near a spring, where the date palm grows. Sometimes the hot sun dries up the spring, and then the family must find a new home.

The camels are brought up, and the loading begins.



Each camel kneels until he has his burden placed on his back. Some have large bags of water fastened to them; some carry the cushions and food; some are loaded with the tents and poles. Hassan and his mother and sister ride on camels. Hassan's father rides a beautiful horse, with slender legs.

They start very early in the morning before the sun is up.

They may travel for days and days, and not see a palm tree or a stream. If they did not have the bags of water and the food, they would die of thirst and hunger.

When a stream is near, the camel smells the water, and will start off at a brisk trot to reach it.

How welcome the fresh dates and water are to the people!

It does not take long to pitch the tent under the palm trees in their new home. Here they will stay until the water and fruit are gone; then they will move again.

Would you like to hear how the Arabs look and dress?

They are dark-skinned, with dark hair and eyes. They wear loose gowns, with wide trousers



THE ARAB'S HOME IN THE DESERT.

gathered at the ankles. They do not wear hats, but each Arab has twisted around his head several yards of cloth. These cloth head-dresses are called turbans.



27. THE CAMEL.

THERE are two kinds of camels. One has two humps on its back; the other has only one. The home of the camel is in Africa and Asia.

It can carry such heavy burdens over the sandy country, that it has been called the "ship of the desert."

The feet of the camel are large and wide. On the bottom of each are pads or cushions, which help the camel to tread firmly upon the soft sand. These cushions are covered with a hard skin, which is not hurt by the almost burning sand of the desert.

The camel's eyes are shielded from the glare of the sun by overhanging brows and long eyelashes. In a sandstorm, the camel can close its nostrils to keep out the sand.

This animal is a cud-chewer. All the animals belonging to this family have four stomachs. *The camel* uses one of these to hold water.



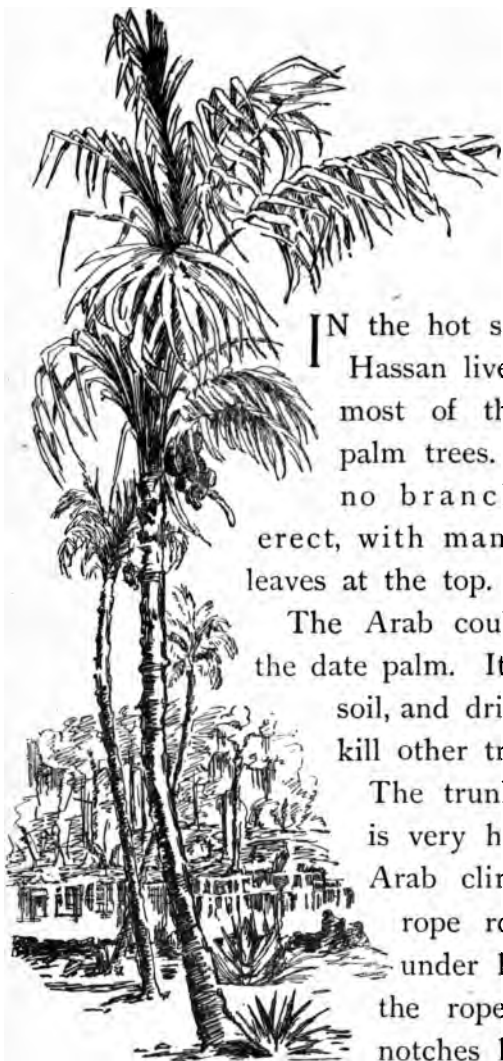
CAMELS.

When a camel cannot get water for a number of days, it uses the water from this stomach. But it can smell water a mile away, and when men are in need of water, they let the camel go in the direction it wishes. If there is water, the animal will take them to it.

There is another strange thing about the camel, which makes it well suited for the desert. The humps on its back are fat, which is taken into its body to nourish it when the camel can get nothing to eat. Sometimes after a long journey, there is hardly any hump left.

The camel is taught to kneel when the men load it. It has a hard skin on its legs and breast to protect it from the hot sand.

Sometimes the camels and men cross the desert in great numbers, and the company is then called a caravan.



28.
THE PALMS.

IN the hot sandy country where Hassan lives, the Arabs obtain most of their food from the palm trees. These trees have no branches. They grow erect, with many green, feathery leaves at the top.

The Arab could not live without the date palm. It will grow in sandy soil, and drink water that would kill other trees.

The trunk of the date palm is very hard to climb. The Arab climbs it by tying a rope round his back and under his arms. He puts the rope into one of the notches left by a fallen leaf, and taking hold of the trunk with his hands *and knees*, raises himself a little at a time;

then he throws the rope into the next notch, and raises himself again. He does this until he reaches the top.

When the clusters of fruit are reached, they are picked and thrown down. Men hold a cloth by the corners under the tree, and catch the dates as they fall.

Dates are pounded into hard cakes, and are used for food in crossing the desert.

Other palms grow in other countries. The cocoanut palm is very beautiful. It sometimes grows to be a hundred feet high. Do you know of any building as high as that?

The fruit of the cocoanut tree is a large nut. It has a thick husk. The flower is not so large as a kernel of corn, yet this large cocoanut grows from it. When these huge nuts are ripe, they fall to the ground. They are so heavy, that people who have been struck by them have been killed.

Like the date, the cocoanut palm is one of the most useful of trees. The leaves, flowers, fruit, shell of the fruit, and trunk of the tree are used for many purposes.

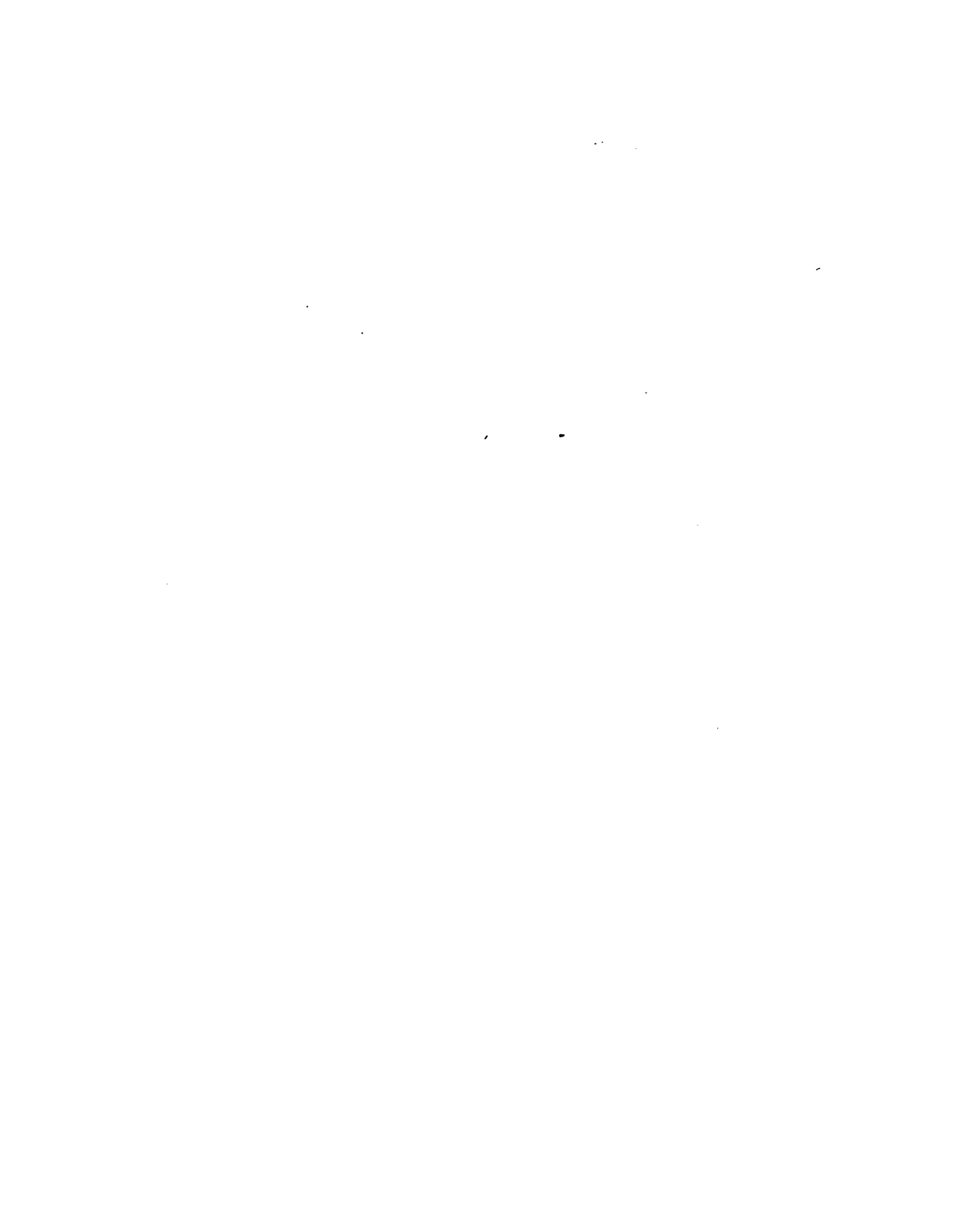
There are many kinds of palm trees. Some of them grow in Florida. Find that state on

the map, and you will see that it is not very far from your home.

Palm trees give us dates, cocoanuts, fans, oils, medicine, rope, and beautiful woods. We use the leaves to make hats, fish-nets, shutters, baskets, writing-paper, bedding, roofs for houses, and many other things.



PALM TREES.



29. THE PALM TREE.



IS it the palm, the cocoa palm,
On the Indian Sea, by the isles of balm?
Or is it a ship in the breezeless calm?

A ship whose keel is of palm beneath,
Whose ribs of palm have a palm-bark sheath,
And a rudder of palm it steereth with.

Branches of palm are its spars and rails,
Fibers of palm are its woven sails,
And the rope is of palm that idly trails!

What does the good ship bear so well?
The cocoanut with its stony shell,
And the milky sap of its inner cell.

What are its jars, so smooth and fine,
But hollowed nuts, filled with oil and wine,
And the cabbage that ripens under the Line?

Who smokes his nargileh, cool and calm?
The master, whose cunning and skill could charm
Cargo and ship from the bounteous palm.

In the cabin he sits on a palm mat soft,
From a beaker of palm his drink is quaffed,
And a palm thatch shields from the sun aloft!

His dress is woven of palmy strands,
And he holds a palm-leaf scroll in his hands,
Traced with the Prophet's wise commands!

The turban folded about his head
Was daintily wrought of the palm-leaf braid,
And the fan that cools him of palm was made.

To him the palm is a gift divine,
Wherein all uses of man combine,—
House, and raiment, and food, and wine!

From Whittier's *The Palm Tree*.

HOUGHTON, MIFFLIN & Co., Publ.

30. BLACK HAWK.



BLACK HAWK is the name of a little Indian boy who lives in the far west. Many years ago, when Columbus came to America, the Indians owned all of this beautiful country. But the white people have driven them farther and farther west.

Black Hawk's father is an Indian chief, and a brave warrior.

This little boy has long, straight black hair and a dark reddish-brown skin. He does not live in a house, as you and I do; but his home is made of branches of trees crossed at the top to make a framework for the skins that are wrapped around them.

This house or tent made of skins is called a wigwam.

Black Hawk's father does not have a stove in his wigwam in winter, but builds a fire of sticks on the ground in the tent. An opening is left *at the top* to let out the smoke.

Indians do not care for a better house, because they move very often, and this one can be easily torn down and set up again.

Black Hawk's father teaches him to hunt and fish, and gives him a bow and arrows and a tomahawk. The tomahawk has a wooden handle and a head made of a sharpened stone.

When he is a little older, his father will teach him to build a canoe. They will find all the materials in the forest in which they live.

The canoes are made of birch bark. The edges are all sewed together with a thread made of roots. The cracks are filled with pine resin. Next the bark are thin pieces of cedar.

The canoe is safe and light for the Indian, who makes it fly over the water. If you or I tried it, over we should go—splash!



Indian men do not like to work. They spend most of their time hunting and fishing. The women have most of the work to do. They plant corn, and when it is ripe, grind it between two stones.

It was from the Indians that the white men learned to plant corn,

and it is sometimes called Indian corn, or maize.

The Indian women do some very fine work. They make cushions, bags, baskets, and moccasins, working patterns on them with colored beads.

Have you ever seen how they carry their babies? The mother carries the little papoose on her back, in a sort of cradle that is made when the babe is born. This is not at all like our baby's cradle. It is a board covered with soft skins; a skin is put over the papoose, and he is strapped to the board.

When his mother goes out to work, she takes the cradle off her back and hangs it upon one of the lowest boughs of a tree.

Black Hawk's sister does not have much fun. When very young, she is taught to hoe and grind the corn. She cures the skins of the animals which her father and brother shoot. She helps her mother do the cooking, gather firewood, fetch water, and pick berries.

31. HIAWATHA'S CHILDHOOD.

WHEN Hiawatha was a baby, his mother died, and he lived with his grandmother, Nokomis. Her wigwam stood in a thick forest, on the shore of the Big-Sea-Water.

Here old Nokomis nursed little Hiawatha and rocked him in his cradle, singing many strange songs to him.

When Hiawatha grew older, he sat at the door of the wigwam, where he heard the whispering of the pine trees, heard the lapping of the water, and learned a little song to sing to the fire-fly.

He saw the moon rise, and seeing the shadows on it, asked Nokomis to tell him about them.

Good Nokomis said, "Once a warrior, very angry, seized his grandmother and threw her right against the moon. It is her body you see there."

He saw the rainbow, and whispered, "What is that, Nokomis?"

Nokomis answered, "'T is the heaven of flowers

you see there. After all the wild flowers of the earth fade, they blossom again in heaven."

Then Hiawatha learned the language of every bird, learned their names and all their secrets,—how they built their nests in summer, and where they went in winter.

He talked to them when he met them, and called them Hiawatha's chickens.

He learned the language of all the beasts, learned their names and all their secrets,—how the beaver built its lodges, where the squirrels hid their acorns, how the reindeer ran so swiftly, and why the rabbit was so timid. He talked to them wherever he met them, and called them Hiawatha's brothers.

Adapted from Longfellow's *Hiawatha*.

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32. HIAWATHA'S FIRST DEER.

LAGOO, a friend of old Nokomis, made a bow for Hiawatha.

He made the bow from a branch of ash; the cord was made of deer-skin. The arrows he tipped with flint and winged with feathers.

Then he said to Hiawatha: "Go, my son, into the forest, where the reindeer herd together, and kill for us a deer with antlers."

Hiawatha walked very proudly into the forest with his bow and arrows.

As he passed, the birds sang, "Do not shoot us, Hiawatha!"

The squirrel laughed and chattered, and said, "Do not shoot me, Hiawatha!"

But he did not seem to hear them; he was thinking only of the red deer.

Hidden in the bushes, he waited until the deer came.

He waited until he saw the antlers lifted, and the two shining eyes.

Then as the deer came down the path, with beating heart Hiawatha rose on one knee, and aimed an arrow.

The arrow struck the deer, and it lay dead in the forest.

Hiawatha, very happy, bore the red deer home, and Iagoo and Nokomis were delighted. From the skin of the deer, Nokomis made a cloak for Hiawatha, and of the flesh they made a feast in honor of the young chief. All the village came and feasted, praising Hiawatha.

Adapted from Longfellow's *Hiawatha*.



33. VAPOR.

ONE morning, Agnes was helping her aunt in the kitchen. The teakettle was singing merrily on the stove.

"Aunt Clara," said Agnes, "see the steam coming from the teakettle!"

"That cloud you see is water-dust," said her aunt. "Look near the spout; do you see any *water-dust* there?"

"No," said Agnes, "I do not."

"That is vapor, and you cannot see it. You would not see the water-dust above, if the air in the main part of the room were not cooler than that close to the spout of the teakettle.

"Hold a cold plate near the spout, and see how the water gathers on it."

"The plate is so cold, it changes the vapor to water," said Agnes.

"There is vapor in the air all around us, but we cannot see it," said Aunt Clara. "Have you ever set a dish of water out of doors, and in a few hours found much of it gone?"

"Yes," said Agnes, "and I have seen that happen in a room; but it takes longer for the water to disappear, unless the dish is put on a stove. Then it becomes empty in a short time."

"We say the water has evaporated," said Aunt Clara. "Heat helps water to evaporate. What becomes of the water in the clothes we hang on the line to dry?"

"The heat in the air must make it evaporate," said Agnes. "I have often noticed how much sooner they dry when the sun shines."

"Yes," said Aunt Clara, "but clothes will dry

on a cold day in winter, though slowly. They dry partly because the air about them is not full of moisture, and cold air will hold some moisture; but warm air, of course, holds more than cold. The wind, too, will help them to dry."

"I have seen the sidewalks steam after a rain," said Agnes; "why is that?"

"That is because the air is cool enough to change the vapor rising from the wet walks into water-dust, and it shows itself in little white clouds."

"Oh, I understand!" said Agnes. "I remember you cannot see the moisture in your breath when the air is warm; but as soon as you go where it is cold, the vapor changes into water-dust."

"Come to the kitchen some wash-day in winter," said Aunt Clara, "and you will see all that I have told you about vapor,—the vapor rising from the hot water in the boiler; the cold air in the room changing the vapor into water-dust or clouds; these clouds striking the cold windows and becoming drops of water."

34. CLOUDS.

HAVE you ever seen the fairy vessels in the sky as they go sailing by? What are these ships, and how did they come there?

We know there is vapor in the air, though we cannot see it. Think from how many things the heat of the sun can draw vapor.

It draws it from the ocean, the lakes, the rivers, the little mud puddles, the ground, and the dishes of water standing around. The plants give moisture to the air. People and animals breathe out moisture. There are so many ways in which the air obtains moisture, that we could hardly name all of them.

When the air is warm, the vapor is carried off into higher parts of the air; but when cold air strikes it, it is turned into water-dust or clouds.

When the vapor is changed into water-dust high in the air, we call it clouds; but when it is changed close to the earth, we call it fog.

There are different kinds of clouds. Some are of feathery form, spread out over all the sky, or arranged in narrow stripes. The rain clouds are heavy, black or gray, and are best seen in a storm.

We see great piles of white clouds on a summer day. As the sun becomes warmer, some of the water-dust in these clouds changes back to vapor, and they rise higher and higher. They usually disappear with the sunset; but if they grow larger and darker in the evening, it means rain.

35. RAIN.



SEE it rain! Where does the rain come from? It comes from the clouds. The sun draws up the vapor from the oceans, lakes, rivers, and ponds.

The cold air changes the water-dust or clouds into drops of rain. When the rain cloud is near the earth, the drops are much larger than when the cloud is high in the air.

In summer, when we have not had rain for some time, how the plants wither and droop! Some turn yellow and lose their leaves. Poor things, they have nothing to drink!

How they seem to brighten and hold up their heads after a rain! The air is different; it has been made pure by the rain. The rain has cleaned the dusty streets, walks, and houses.

The rain gives water to the springs, lakes, and rivers. It quenches the thirst of the plants, grain, and trees.

36. DEW.

FARMER DAVIS was going to the orchard very early one morning to gather apples. The night before, he said to his little grandson, who was visiting him, "Edward, should you like to go with me in the morning?"

"Yes, indeed!" said Edward; "please don't forget to call me."

His grandfather did not forget, but called him at five o'clock. As they walked across the large yard, Edward said, "Oh, grandpapa, my feet are very wet! I did not know that it rained last night."

"It did not rain," said his grandfather. "It is the dew which has wet your feet. See how the dewdrops sparkle when the sun strikes them!"

"They look like millions of diamonds," said Edward. "The grass and flowers are covered with them."

"Yes," said his grandfather, "the flowers and *grass* enjoy drinking the fresh, cool water."

"But how did these drops come?" asked Edward.

"The earth gets its heat from the sun, not from the air," said his grandfather. "The earth and all kinds of plants give off their heat. So at night, when there is no sun to give them more, they grow cold.

"When the air, which is full of vapor, touches the cold plants and grass, the vapor is changed into little drops of water, called dew.

"How is it, Edward, that there are drops of water on the outside of a pitcher of ice-water?" asked his grandfather.

"I think I see now," said Edward. "The warm air in the room holds vapor; but when it strikes the outside of the cold pitcher, this vapor is changed into drops of water. But do you know, grandpapa, I used to think those drops came through the pitcher?"

His grandfather laughed, and said, "You are not the only one who has thought that."

37. FROST PICTURES.

ANNA wakened one morning to find that the frost fairies had been at work making pictures on the window in her room. There were roads with beautiful fir trees on either side, a little house, and ever so many brownies running and rolling in the snow.

When she reached the sitting-room downstairs, she looked at the windows there. The fairies had done their work there, too.

"Oh, mamma," said Anna, "how did the fairies put these pretty frost pictures on the window? See, there is a hill in this one with many trees, and here is another with beautiful ferns and the finest lace work!"

"We will talk about these pictures," said mamma, "and then, maybe, you can be a frost fairy yourself. Those pictures were made from the vapor in the room."

"Where does the vapor come from, mamma?" asked Anna.

"*Some comes from our breath, and some from*

the water we put on the stove. You cannot see the vapor coming from the water; but when I hold this cold plate over it, the vapor gathers quickly.

“The plate chills the air which strikes it, and makes the air drop some of its vapor. This changed vapor sticks to the plate. The cold windows act in the same way.”

“Oh, I see!” said Anna; “the windows are so very cold that they freeze the vapor and make the lovely frost pictures.”

“Step to the window,” said mamma, “and breathe on the cold panes. Then tell me what happens.”

Mamma heard her little son crying, and left the room. When she came back, Anna had a long story to tell about the frost forest she had made on the window.

38. LITTLE JACK FROST.

LITTLE JACK FROST went up the hill,
Watching the stars and moon so still,
Watching the stars and moon so bright,
And laughing aloud with all his might.
Little Jack Frost ran down the hill,
Late in the night when the winds were still,
Late in the fall when the leaves came down,
Red and yellow and faded brown.

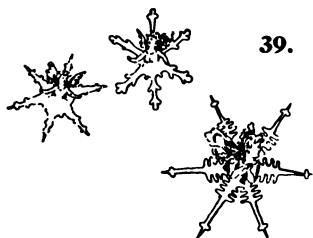
Little Jack Frost walked through the trees;
"Ah," sighed the flowers, "Good-bye little leaves!"
"Ah," sighed the grasses, "Jack Frost is nigh!"
Said Little Jack Frost, "Good-bye! Good-bye!"
Little Jack Frost tripped round and round,
Spreading white snow on the frozen ground,
Nipping the breezes, icing the streams,
Chilling the warmth of the sun's bright beams.

But when Dame Nature brought back the Spring,
Brought back the birds to chirp and sing,
Melted the snow and warmed the sky,
Little Jack Frost went pouting by.

The flowers opened their eyes of blue,
Green buds peeped out and grasses grew;
It was so warm and scorched him so,
Little Jack Frost was glad to go.

. Songs and Games for Little Ones.

OLIVER DITSON, Publ.



39. THE LITTLE WHITE FAIRIES.

ONE day late in the fall, a large lake lay shining in the sunlight. The Sun, like a fairy godmother, was touching it with her golden wands,—the sunbeams.

This great fairy was calling to the many little fairies in the lake to come out and enjoy themselves in the air.

At that time, there were no pretty flowers for the fairies to swing upon; the birds had flown away, and the trees had lost their leaves. To be sure, the oak still kept hers, but they were not very pretty. The great rocks stuck up through the bare earth. It would have been very dreary, if it had not been for the sunbeams.

The Sun was the little fairies' godmother, and with her wand she tapped for them to come out.

The fairies heard the tap. As they came, each one put on her light gray water-proof. Sometimes, as fairies do, they became invisible. At

other times, one could see them floating in the air.

By and by they grew cold, for their little dresses were very thin. The cold became so intense, that they could not stand it any longer. One said to another, "Let us go and pay a visit to our godmother; it looks warm up there."

So up, up they went, higher and higher, until they looked like a fleecy cloud. Before they reached the home of their godmother, the enemies of the good fairies met them.

These enemies were the cold winds. They seized the little creatures, and blew them hither and thither, tearing their pretty gray water-proofs. Some of the little sisters were blown away and lost.

These terrible winds kept on blowing. It grew colder and colder. A very cold blast so frightened the little fairies, that they turned pale.

Look! What has happened to them? They are all dressed in white frocks. Six little points are on each tiny skirt.

They are no longer frightened, for they see that the



winds have done them no harm. They like their new dresses.

One of them said, "Let us go to the earth, and show these pretty dresses to our gray sisters down there."

"Let us go quietly and surprise them," said another; "I wonder if they will know us."

So down they go, softly and slowly, and cover the brown earth.

Next day, when their fairy godmother touches the fairies with her golden wands, they sparkle like diamonds.



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